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Peer-Assisted Learning Strategies (PALS): Success Factors to Improve Student Reading Skills

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Chapter 1: Introduction

Educators have continuously strived to provide the least restrictive environment (LRE) for their learners while serving their unique needs in reference to The Individuals with Disabilities Education Act (IDEA, 1997; 2004). Additionally, IDEA required that all students with disabilities have access to the general education environment as appropriate as possible. No Child Left Behind Act (NCLB, 2002) was also closely aligned with IDEA that all children including those with disabilities be able to access general education curriculum, standard, and requires teacher's accountability for their students' learning outcomes. NCLB aimed for all students to meet standards of knowledge and skill while teachers are held accountable for their students' outcomes eventually. In the meantime, both NCLB and IDEA reinforced implementing scientific research and evidence-based instructional practices to intervene in the diverse needs of students with or without disabilities (McMaster, Fuchs, & Fuchs, 2007).

Proficient reading skill had shown strong correlation to academic and social success in various research for decades. However, attaining reading proficiency is the most common challenge for students regardless of their grade level, let alone with students with disabilities. Approximately 80% of students identified with learning disabilities exhibited deficits in reading skills and large portions of students with disabilities, regardless of categories, tended to have deficits in reading and language skills (Rafdal, McMaster, McConnell, Fuchs, & Fuchs, 2011).

As students in public schools in the U.S. are becoming more culturally and linguistically diverse (CLD), there has been a gradual increase in the number of students who need English as a Second Language services and/or additional interventions. There is another growing group of students who struggle in reading and language skills. To remediate their struggles in reading and

language skills, educators are required to modify and differentiate their conventional instruction to accommodate the different needs of CLD students and students with disabilities (Fuchs, Fuchs, & Burish, 2000). Because academic and social achievement rely heavily on reading and language skills, increasing those skills becomes an essential part of success in school settings for those children. CLD students and students with disabilities have been reported to have lower academic achievement in their grade level than their general education peers, as well as more negative experiences in schools. In other words, CLD students and students with disabilities working with their general education peers who have better reading skills could provide opportunities to increase their reading skills as well as obtaining a better school experience for both groups of students with or without disabilities. Additionally, the entire student body can increase their social skills and exchange positive emotional influences by interacting with a group of students with whom they did not usually interact with (Thorius & Graff, 2017).

Peer-Assisted Learning Strategies (PALS) is a research-based intervention which addresses both academic and social issues. PALS is an evidence-based strategy derived from Class-Wide Peer Tutoring (CWPT). PALS aims to enhance participating students' cooperative skills and academic skills. The primary focus is on students with disabilities. PALS seeks to provide the least restrictive environment as well as frequent immediate feedback to those students with diverse needs. It was designed to be a complementary curriculum for existing reading methods through highly structured activities and prompts, which provided a positive academic and social experience. PALS focuses on enhancing foundational reading skills such as phonological awareness, decoding, reading fluency, and comprehension (Thorius et al., 2017).

Research Question

One research question guided this literature review: What are the success factors of Peer-Assisted Learning Strategies (PALS)?

Focus of the Paper

In Chapter 2, the review of literature includes 11 studies. Publication dates of the studies range from 2001 to 2011. The studies examined success factors of Peer-Assisted Learning Strategies in kindergarten, grade 1, and grades 2-6. The studies in Chapter 2 included 10 quantitative and one qualitative study.

I used key words and combinations of keywords to locate studies: *Peer-Assisted Learning Strategies, PALS, Class-wide Peer Tutoring, CWPT, peer-assisted, peer-mediation, peer-tutoring, reading, special education.* I searched literature online using the following databases: Academic Search Premier, SAGE Journals, EBSCOhost Academic Search Premier, PsycINFO, and ERIC.

Background

Peer-Assisted Learning Strategies (PALS) provides cooperative learning opportunities to students. It is a descendent of the Class Wide Peer Tutoring (CWPT) program with clear and structured responses and shared responsibilities of all students, both tutors and tutees. PALS is a supplementary reading practice to the existing core curriculum which was designed to be implemented three times a week for approximately 35 minutes per session. PALS provides frequent opportunities for students to respond and engage in extended intense practice and, consequently, to experience more frequent success in reading. The goal is to improve students'

foundational reading skills, including phonological awareness, decoding, fluency, and reading comprehension (Stein et al., 2008).

In the reciprocal learning process, students work in pairs consisting of higher- and lower-performing readers. In the grouping process, students are ranked from high to low reading level. Then the list is split in half as stronger and weaker. Next, the first students from each half are partnered up as a pair and the same for the rest of the students. During reading activities, the stronger reader is always the first reader and models to the weaker reader. Both students in a pair take turns as "Coach" (tutor) and "Reader" (tutee) during PALS activities. The Coach listens to the Reader, provides immediate feedback by prompting scripted responses while practicing reading strategies (Thorius et al., 2017).

PALS includes different grade level versions for kindergarten, grade 1, grades 2-6, and high school. Primarily, the strategy is aimed at grades 2-6 and, subsequently, it extended downward to lower grade levels and then upwards. The grades 2-6 version includes three reading activities: 1) partner reading with story retell, 2) paragraph shrinking, and 3) prediction relay. (Sáenz, Fuchs, & Fuchs, 2005).

In kindergarten PALS, there are two main activities. First, "Sound Play" addresses phonological awareness. The activity is then broken down into five subcategories of phonemic awareness exercises, rhyming, isolating first sounds and ending sounds, blending sounds, and segmenting words into sounds. Secondly, "Sounds and Words" is based on letter-sound correspondence and beginning decoding. This is also categorized into two activities, "What Sound?" and "What Word?" (McMaster, King, Han, & Cao, 2008).

First-grade PALS is focused on phonological awareness, decoding skills, and word recognition. There are two parts to the program, Sounds and Words and Story Sharing. In Sounds and Words students work on decoding skills to increase phonemic awareness skills through activities including “Letter sounds,” “Say the sound,” Sounding out,” and “Sentences and Stories.” In Story Sharing, students take turns in three main activities of prediction, read aloud, and story retell (Calhoon, Al Otaiba, Cihak, King, and Avalos, 2007).

Importance of the Topic

PALS was expanded from CWPT which was designed to increase student engagement during instructional time. Research showed CWPT can improve students’ performance in reading, spelling, and math in both elementary and secondary levels. Extended studies conducted on a large-scale reported a positive influence of PALS on the academic and social performances of both groups of students with and without disabilities. The studies also explored the effectiveness, regardless of socioeconomic status across urban and suburban school districts. In addition, PALS has been examined throughout variety of grade levels from kindergarten to secondary. Important features of PALS include structured reciprocal roles in activities, frequent opportunities to respond and engage, and supplemental practice of reading skills in the core reading curriculum (McMaster et al., 2007).

Definitions of Terms

Peer-Assisted Learning Strategies (PALS) is an evidence-based practice that supplements the primary reading curriculum. PALS emerged from Class Wide Peer Tutoring (CWPT) strategies (Sáenz et al., 2005).

Class-Wide Peer Tutoring (CWPT) is a research-based practice developed to meet diverse needs in general education classrooms. Students are taught by peers who are trained and supervised by the classroom teacher during the implementation of the strategy (Maheady & Gard, 2010).

Grades 2-6 PALS is the initial PALS program developed to improve students' reading skills in grades 2 through 6. The program consists of three activities: 1) Partner Reading, 2) Paragraph Shrinking, and 3) Prediction Relay (Fuchs et al., 2001b).

Kindergarten PALS (K-PALS) is designed for kindergarten students to enhance their reading skills. It is extended downward from Grades 2-6 PALS. The program incorporates two main types of activities: 1) Sound Play and 2) Sounds and Words (Fuchs et al., 2001b).

First-grade PALS is geared toward students in first grade. The program contains Sound and Words activities (Fuchs et al., 2001b)

No Child Left Behind (NCLB, 2002) was the main law for K–12 general education in the United States from 2002 to 2015. The law stressed that all students have access to general education classrooms, curriculum, and accountability systems. Schools and educators were held accountable for students' learning and achievement. As the accountability increased, the demand for evidence-based practices also increased (Stein et al., 2008).

Individuals with Disabilities Education Act (IDEA, 2004) ensures special education and related services to eligible children with disabilities. Zero reject and evaluation components require students to be located and assessed to identify if the student has an IDEA-related disability. Students identified with disabilities are to receive Free and Appropriate Public Education (FAPE) in the least restrictive environment (LRE) to the maximum extent. It mandates

educators follow procedural safeguards and collaborate with parents to participate in their children's education (Rafdal et al., 2011).

Culturally Linguistically Diverse (CLD) student comes from a home environment where a language other than English is spoken and has different cultural values and backgrounds from the mainstream culture. CLD students may be referred by different terms, such as limited English proficient (LEP), language minority student, or English-language learner (ELL). (Thorius et al., 2017).

English Language Learner (ELL) refers to an individual who is learning English in addition to their native language or any other language they may speak. The term includes students from non-English-speaking backgrounds. ELLs are also referred to as CLD (Sáenz et al., 2005).

Reciprocal teaching is an instructional activity in which students are paired by teacher based on ranking. A high-performing student becomes teacher to a low-performing peer after teacher modeling. The students take turns in the teacher role within the pair. It is a dyadic structure of frequent interactions between the students (Thorius et al., 2017).

Fidelity is measured after implementation of evidence-based practices. Fidelity shows that the practice has been implemented as designed maintaining the components that made the original practice effective. High fidelity can result from clearly teaching all of the components, procedures, and expectations of the practice in the beginning of implementation (Torres, Farley & Cook, 2014).

Chapter 2: Review of the Literature

Scope of Review

The purpose of this literature review was to identify success factors of PALS reading strategies. Extensive review of peer-mediated instructional strategy shows effective components in implementation of PALS. Table 1 shows the summary of findings of the studies in the same chronological order in which they appear in Chapter 2.

Review of Related Literature

Falk and Wehby (2001) examined the effectiveness of K-PALS in improving beginning reading skills of a group of kindergarten students identified with EBD. The research was aimed to study existing concerns of effective reading interventions for students with EBD. Researchers assumed that problems in reading would contribute to academic underachievement and school failure.

Participants were six male kindergarten students ages 5 to 6 years in self-contained classrooms. Four of the students had a primary identification of speech and language disorder and two with other health disorders with a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). An individual pretest was administered on four different probes to measure reading performance. The four domains were: 1) letter-naming, 2) letter-sound association, 3) segmentation, and 4) blending. During the study period, weekly progress monitoring assessment was administered on the same four measures. Since the participants were not receiving any formal reading instruction, a multiple-baseline design was employed. The pre-baseline phase only consisted of teacher-directed sound play lessons to achieve stable reading performance. Then, the baseline phase began incorporating both sound play activities and

teacher-directed decoding lessons. Finally, the K-PALS intervention was introduced sequentially to the participants three times a week for 11 weeks to the entire class. The intervention consisted of initial teacher-directed activities followed by peer tutoring activities. The K-PALS treatment were two activities: sound play and decoding. The treatment also incorporated a point system rewarded for following PALS procedures and rules, cooperation, and completion of activities (Falk & Wehby, 2001).

Data analysis included comparing pretest and posttest scores of the students. The comparison revealed that K-PALS intervention was successful in student performance growth in beginning reading skills. Significant increase in letter-sound identification and blending was noted in four of the participating students. One of the other two students showed an increase at the 11th week as a result of individualized behavioral contingency. In comparison, student performance in segmentation probes were notably inconsistent. The variability in segmentation performance may be attributed to several reasons:1) abstract and less explicit instruction during the baseline phase, which was teacher-led activities, 2) segmentation requires higher-order reading skills, 3) segmentation activities were not included in peer tutoring lessons, and 4) speech impairment in participating students may have interfered with student achievement. The result indicates the success factors as high fidelity, contingency management, and explicit instruction (Falk & Wehby 2001).

Mathes and Babyak (2001) conducted a study to first replicate the efficacy of 1st-Grade PALS on different achievement levels from previous research. Furthermore, the study investigated the effectiveness of additional skilled-focused mini-lessons with 1st-Grade PALS on

the lowest-performing readers. It was aimed to examine the possible benefits of additional small-group mini-skills lessons (PALS + ML) on the lowest-achieving students.

Participants of the study were 30 first-grade teachers later categorized by school demographic similarity as high, middle, or low. The teachers were randomly assigned to the 1st-Grade PALS, 1st-Grade PALS + ML, or Contrast group. Each group had a total of 10 teachers consisting of three teachers teaching at the high level, four teachers at the middle level, and three teachers at the low level. However, two teachers in 1st-Grade PALS + ML withdrew from the study over the course, which concluded with three teachers in the high level (high achieving, HA), three teachers in middle (average achieving, AA), and two in low (low-achieving, LA) for 1st-Grade PALS+ML group. Student participants were determined by teacher ranking and a couple of assessments. The assessment included a 1-minute oral reading assessment at a mid-first-grade level and a phonological awareness probe of segmenting (Mathes & Babyak, 2001).

Prior to implementation of treatments, the participating teachers attended an all-day training. In addition to training, an on-site staff was present to provide support as needed. 1st-Grade PALS intervention was conducted to the entire class for 30 minutes for three times per week for 14 weeks. During the intervention the students were paired up using a ranking system. The students practiced phonological awareness, phonological recoding, and reading text connected to previously mastered phonological elements. It also involved making predictions about a book before reading, sharing the story after reading, and verbally summarizing by retelling as peer tutoring activities. LA participants in the 1st-Grade PALS + ML group implemented additional mini-lessons that lasted 15 to 20 minutes, three times per week during

the final 6 weeks of 1st-Grade PALS implementation. The mini-lessons mirrored the exact content of 1st-Grade PALS to provide supplemental instruction (Mathes & Babyak, 2001).

The Woodcock Reading Mastery Test-Revised (WRMT-R) was used to measure pre- and post-tests in reading achievement. The results revealed that participants in 1st-Grade PALS showed significant growth in reading performance. Data analysis specified statistically significant differences between groups for AA students on Words Attack, Word Identification (Word ID), and Passage Comprehension. Effect size data indicated that LA students in 1st-Grade PALS + ML benefited more compared to LA students in just 1st-Grade PALS on Word Identification and Word Attack subtests. Participant teachers and students positively responded to the effectiveness of 1st-Grade PALS. The responses included greater reading self-confidence in students, enhanced social skills, increase in student engagement, and professional development opportunity for teachers. Key success factors were high fidelity of implementation, increased student participation, and explicit instruction (Mathes & Babyak, 2001).

Fuchs et al. (2001a) conducted a study to examine the effectiveness of phonological awareness training with and without beginning decoding instruction and practice. The researchers acknowledged the importance of early intervention in foundational reading skills, such as phonological awareness in link to reading performance. The purpose of the study was to compare student reading performance after phonological awareness training and also the training with additional beginning decoding instruction in form of peer assisted learning.

The study consisted of two treatment groups and one control group. The first treatment group was phonological awareness training. “Ladders” was implemented as the phonological awareness program. The other treatment group was Ladders + PALS. This treatment involved

students working in pairs assigned by their teacher. K-PALS was implemented as additional beginning decoding instruction and practice. The participants were 33 teachers from either Title I or non-Title I schools. The teachers were randomly assigned to three groups and conducted treatments for approximately 20 weeks. A Rapid Letter Naming (RLN) test and teacher judgment were used to select 404 participating students. The students were rated low achievers (LA), average achievers (AA), and high achievers (HA). Additionally, 25 students were identified as receiving special education. Phonological awareness and alphabetics constructed the measures in the result. Phonological awareness included segmenting and blending tasks. Alphabetics consisted of RLN, Rapid Letter Sound (RLS), Word ID subtest of Woodcock Reading Mastery Test-Revised, Form G (WRMT-R), Word Attack (WRMT-R), and Spelling subtest of the Wechsler Individual Achievement Test (WIAT) (Fuchs et al., 2001a).

In conclusion, at the end of kindergarten, the participants of the two treatment groups, Ladder and Ladder + PALS, outperformed those in the control group on the phonological awareness measures. Moreover, the Ladder + PALS group showed higher achievement on the alphabetics measure including reading and spelling. A post-treatment questionnaire was completed by the participating teachers. The responses indicated that PALS positively worked in increasing students' overall reading readiness and improving students' social skills. Contributing success factors are high fidelity, explicit instruction, increased student participation, and peer-mediated activity (Fuchs et al., 2001a).

Fuchs et al. (2002a) extended their research from Fuchs et al. (2001a). In this study, the researchers focused on 25 students with disabilities from the previous research. The studies were rooted in a finding that phonological awareness can be explicitly taught. The research was

grounded on the thought and also aimed at finding the effectiveness of supplemental peer tutoring in students' basic reading skills. The target population was students with disabilities in mainstream classrooms.

The study consisted of three groups: 1) phonological awareness training (PA), 2) PA + PALS, and 3) control. Nineteen teachers out of 33 from Fuchs et al., (2001a) were selected as participants and 5, 5, and 9 were assigned to each group. Out of 404 students in the previous study, 25 students were identified as having an Individualized Education Program (IEP). The student participants were rated as LA, AA, and HA based on their RLN pretest (Fuchs et al., 2002a).

Results indicate that students with disabilities in PA + PALS outperformed those in the other two groups on Word Attack. Furthermore, PA + PALS students showed greater increase than PA students on RLS. When compared effect sizes on all measures, excluding RLN, PA + PALS and control groups had small to moderate differences and PA + PALS and PA groups had larger differences, all favoring PA + PALS group. The analysis of data corresponded with the prior research data. The data on individual students' pre-to-post-treatment showed that students with disabilities in the PA + PALS groups made strong growth on RLS, Segmenting, Word ID, and Word Attack. Findings suggested that more student engagement in PA + PALS treatment led to more growth in student reading readiness. High fidelity and increased student engagement contributed to success in student growth (Fuchs et al., 2002a).

Fuchs et al. (2002b) examined the social benefits of peer tutoring among students with LD in second- through sixth-grade classrooms. According to previous findings, students with LD show deficits in social skills and have a lower social standing than their peers. In general, peer

tutoring would contribute as a solution to increase social interactions among students. The study measured the social benefits of peer tutoring on students with LD. The study aimed to collect and analyze sociometric data on social acceptance of students with LD participating in PALS and to explore PALS possible effects on social impacts of students without disabilities.

Participants of the study consisted of an elementary school population. A total of 39 teachers participated in the study and were randomly assigned to two study groups: teacher-led instruction with PALS (PALS), and teacher-led instruction without PALS (No-PALS). Specific student participants included one student from each performance level: 1) diagnosis of LD in accordance with state regulations, 2) low achieving student (LA), 3) average achieving student (AA), and 4) high achieving student. A total of 156 students were identified as participants strictly based on their academic performance. The PALS group engaged in four activities: Partner Reading, Paragraph Shrinking, Prediction Relay, and Story Mapping. No-PALS group continued with their usual reading instructions (Fuchs et al., 2002b).

How I Feel Toward Others (HIFTO) was administered 1 week after the PALS treatment session to measure the social acceptance and attitudes in the study. HIFTO is a group sociometric measure tool to assess social status and attitudes of students at the elementary level. The population of targeted students include students without disabilities, with LD, behavior disorders, and mild developmental disabilities in both mainstream and special education settings. When presented with the measurement tool, students have four options: 1) a question mark, 2) a smiling face, 3) straight-mouthed face, and 4) frowning face, to rate for every other child in the class to show how much she or he likes that child. A question mark (unknown) means that the rater does not know. A smiling face (smile) is for students that the rater likes. A straight-mouthed

(neutral) face is marked when feeling indifferent. Finally, a frowning face (frown) is chosen for those the rater dislikes. The four "received" ratings from other students mean a student's social acceptance. On the other hand, the four "assigned" ratings reflect the rater's attitude (Fuchs et al., 2002b).

Results indicated that students with LD who routinely participate in peer-mediated learning are more socially accepted in comparison to those in no-PALS environment. Students with LD in PALS classes had higher social acceptance than those in contrast classes. Furthermore, the students with LD in PALS classrooms received positive social preference ratings equal to LA, AA, and HA students' ratings. By contrast, students with LD in no-PALS classrooms showed statistically significantly negative social acceptance than all students without disabilities. Success factors reported in the study were high fidelity, increased student participation, peer-mediated activity, and contingency management (Fuchs et al., 2002b).

Mathes, Torgesen, Clancy-Menchetti, and Santi (2003) examined the effectiveness of teacher-directed instruction and peer-assisted instruction in comparison. The study aimed to figure out how to best assist teachers in providing beginning reading instruction. Additionally, the researchers emphasized the diversity of student population and the need for instructional strategies that meet the needs of students who struggle in reading. The study aimed to identify effective instructional delivery methods for accelerating low-achieving students' growth in reading.

A total of 22 first-grade teachers participated in the study. Seven teachers conducted first-grade PALS, seven conducted Teacher-Directed Instruction (TDI), and eight were in the contrast group offering traditional instruction. A total of 89 students participated in the study. The

researchers administered 1-minute oral reading fluency and a phoneme segmenting fluency task in screening. Pre- and post-test reading performance was measured using the Woodcock Reading Mastery Test-Revised (WRMT-R), the Test of Word Reading Efficiency (TOWRE), and the Comprehensive Test of Phonological Processes (CTOPP). Additionally, the researchers collected CPM data on oral reading fluency and phoneme segmenting fluency every other week. The teachers were assigned to three different groups to work with their students (Mathes et al., 2003).

First, the PALS condition group replaced part of independent work time or silent reading time with the PALS activity. The treatment was administered in three 35-minute sessions each week for 16 weeks. The students were able to earn points on a shared score card as a reinforcement. Second, small group TDI was administered three times per week for 30 minutes each session. The teachers were encouraged to provide scaffolding according to the immediate needs of their students. The content of lessons exactly corresponded with the first-grade PALS group. Third, the contrast group was left to continue their typical instruction. Input from the researchers was only during continuous progress monitoring (CPM) (Mathes et al., 2003).

Analysis of the data showed that both first-grade PALS and TDI accelerated low achieving students' reading performance compared to typical instruction. First-grade PALS was evaluated to increase in the number of reading materials covered for the year. Three more factors attributed to the success of PALS: 1) accumulative practice and gradual increase in level to help even low-achieving readers to learn and apply the alphabetic principle, 2) the echo-reading during story sharing guided more fluent reading of meaningful connected text, and 3) materials and routines were in a teacher-friendly format for easy implementation. The results imply that

high fidelity of implementation, explicit instruction, peer-mediated activity, and student participation were key factors in PALS (Mathes et al., 2003).

Sáenz et al. (2005) focused on the effect of PALS on the reading performance of English language learners (ELLs) with learning disabilities (LD). Based on the effectiveness of PALS for native English-speaking students with LD, the researchers examined the impact on Spanish-speaking students with LD. The study also examined the subsidiary benefits of PALS for ELLs in range of low-, average-, and high-achievement levels.

Teacher participants were 12 general education educators. They were randomly divided into half and were assigned to the PALS or the contrast group. A total of 132 Spanish-speaking students participated; however, outcome data were collected on 11 students from each class. The 11 students consisted of two students with LD, three low-achieving (LA) students, three average-achieving students (AA), and three high-achieving (HA) students (Sáenz et al., 2005).

PALS condition was provided with teacher and student training, training materials, classroom materials, and reading activities. The treatment was administered in 35-minute sessions three times per week for 15 weeks. The contrast condition group continued with their typical reading instruction. The researchers collected the teachers' lesson plans to evaluate for information regarding: 1) percentage of one-to-one, small group, whole-class activities per week, and 2) percentage of instructional delivery methods of activities either by the teacher or peers. Students' reading performance was measured by the Comprehensive Reading Assessment Battery (CRAB). The assessment tool generates scores in three categories: 1) number of words read correctly, 2) number of comprehension questions answered correctly, and 3) maze choices correct. On the last week of PALS treatment, teachers and students completed questionnaires.

The questionnaires sought teachers' perspectives on the academic and social benefits of PALS for the student population in the study (Sáenz et al., 2005).

To begin with data from lesson plan evaluation, PALS condition (26%) showed twice as much of one-to-one instructional percentage than that of the contrast group (13%). The contrast group had more teacher-led instruction with 94% and PALS with 78%. The percentage of peer-mediated instruction showed a distinct difference of 22% in the PALS group and 6% in the contrast group. The main effect of treatment in the correct number of comprehension questions was statistically significant. Based on the results, PALS improved the reading comprehension of ELL students with and without LD. Important factors such as high fidelity, contingency management, increased student engagement, and level of teacher support have contributed to the increase in student performance (Sáenz et al., 2005).

Calhoon, Al Otaiba, Cihak, King, and Avolos (2007) conducted a study to examine the effect of PALS on reading achievement of first-grade ELLs. The students were enrolled in a two-way bilingual immersion (TWBI) program, known as dual language program. The program is designed to integrate ELLs and English Proficient (EP) students in content and literacy instruction in both languages. The study aimed to investigate: 1) the effects of PALS conducted within a TWBI program on reading fluency, 2) the difference in response of ELL and EP students, and 3) teacher and student perceptions about the effectiveness of the PALS program within TWBI classrooms.

A total of 76 students participated in the study; 43 students in PALS and 33 in the contrast group. A chi-square test of independence revealed that the contrast group had a significantly higher number of students in special education. Additionally, PALS condition

consisted of more female ELL students. Six teachers participated in the study, all who utilized 50/50 TWBI instruction which is providing approximately equal amounts of English and Spanish instruction. The teachers were randomly assigned to either PALS or the contrast group (Calhoon et al., 2007).

The PALS treatment group followed a three-step routine: 1) teacher-directed lesson of the code-focused activities of the day, 2) students practice on the skill under the teacher's supervision, and 3) moving on to Story Sharing, a partner reading activity. The contrast group implemented a wide range of instructional strategies. Due to the nature of the TWBI program, lessons were split equally into English and Spanish. Dynamic Indicators of Early Literacy Skills (DIBELS) measures were used to monitor student performance including subtests: 1) Letter Naming Fluency (LNF), 2) Phoneme Segmentation Fluency (PSF), 3) Nonsense Word Fluency (NWF), and 4) Oral Reading Fluency (ORF). Moreover, questionnaires were used to determine teacher and student perceptions on PALS (Calhoon et al., 2007).

Overall, PALS students showed significantly greater growth compared to contrast students in TWBI program. Teacher and student questionnaires revealed that both groups overall had positive experience in PALS. The treatment increased reading fluency, segmentation skills, and sounding-out skills, which was a strong factor in improving reading performance. The students were actively engaged in their own learning and enjoyed working with a partner as well (Calhoon et al., 2007).

The effect of PALS on overall reading achievement was conducted by a repeated-measures ANOVA. A significant Time (fall, winter, spring) x Condition (PALS vs. contrast) interaction effect favored PALS on ORF. PALS condition showed moderate effect sizes for PSF,

NWF, ORF, and LNF. The next analysis shows different responses to PALS treatment for ELL and for EP students. The response to treatment for ELL students only was conducted by repeated-measures ANOVAs. A significant Time x Condition interaction effect favoring PALS treatment was demonstrated for LNF and NWF. Large effect sizes showed for ELLs in PALS condition for NWF and LNF. ORF and PSF, respectively, showed moderate and small effect sizes. Again, repeated-measures ANOVAs were conducted to analyze response to treatment for EP students. A significant Time x Condition interaction effect favored PALS students for PSF. Large and moderate effect sizes favored EP students in PALS treatment for all measures. Two contributing factors for student success of PALS are increased student participation and explicit instruction (Calhoon et al., 2007).

McMaster et al. (2008) examined the effectiveness of K-PALS as a Tier 1 approach for ELLs beginning to read. Additionally, the study compared outcomes of ELLs in PALS and control groups. The researchers claimed that K-PALS may be effective due to explicit instructions in phonemic awareness, letter-sound, and decoding and interactive teaching and high levels of student engagement. K-PALS also allows frequent opportunities for accurate responses with peer mediated learning.

The study included 60 kindergarten ELL students. An equal number of 20 students were respectively assigned to one of the following groups: 1) K-PALS ELs, 2) Control ELs, and 3) K-PALS non-ELs. A total of 23 teachers participated in the study as either K-PALS with high fidelity of 90% or Control group. Pre- and post-test measures included phonemic awareness, alphabetic (Rapid Letter Naming; RLN), letter-sound identification (Rapid Letter Sound; RLS),

Word Identification (Word ID), The Wechsler Individual Achievement Test (WIAT), and oral reading (Flesch-Kincaid readability grade level of 0.0) (McMaster et al., 2008).

The study was conducted to investigate the effectiveness of K-PALS for beginning EL readers. The analysis of data was conducted through ANCOVAs. According to the result, ELs in K-PALS group performed better than Control ELs on Segmentation, Blending, and RLS. The comparison on effectiveness of K-PALs on ELs versus non-ELs showed no reliable differences between the two groups. The result showed that implementing K-PALS as "Tier 1" instruction can benefit beginning EL readers who struggle. Key success factors of PALS identified in the study are high fidelity of implementation, explicit instruction, and increased student participation (McMaster et al., 2008).

Stein et al. (2008) mentioned that with No Child Left Behind (NCLB), teachers were held accountable for student performance. This led to increased demand for research-based practices. The team conducted a study on K-PALS to examine the effects of on-site technical assistance, teachers' fidelity of implementation, and their perceptions of school climate on student performance. The study aimed to investigate whether different levels of teacher support influences implementation and reading performance.

The study examined groups of four different levels of technical assistance in implementation of K-PALS as following: 1) control group, 2) workshop group, 3) booster group, and 4) helper group. The control group received no training and did not implement K-PALS treatment. Teachers in the workshop group attended a 1-day workshop prior to implementation. The booster group provided teachers with the 1-day workshop as well as two more follow-up sessions. Lastly, in the helper group, teachers received the initial workshop, two booster sessions,

and a trained assistant provided weekly assistance. Data collection were based on RLS as an appropriate indirect assessment tool of K-PALS implementation. RLS measures letter-sound correspondence which is an essential part of the K-PALS curriculum (Stein et al., 2008).

As a result, the effects of the three levels of teacher support K-PALS treatment conditions were shown using multilevel regression model. All the treatment group have higher predicted average RLS gains in comparison to the control group. Initially, the team hypothesized that the increase of teacher support would positively affect student performance. However, based on coefficients and standard errors, the average booster group student showed the most gain in their RLS score. In part, this may be due to the inconsistent quality of assistance provided in the helper group. Three contributing success factors identified in the study are high fidelity, explicit instruction, and level of teacher support (Stein et al., 2008).

Rafdal et al. (2011) investigated the types of necessary professional development and support to ensure fidelity of K-PALS implementation and improved student reading outcomes. This research was extended from a large-scale study of the effectiveness of K-PALS for students with disabilities. They emphasized the importance of early identification and intervention in student success. Moreover, they mentioned a connection between reading problems and overall learning difficulties experienced by students. As an evidence-based classroom instruction (Tier 1 instruction), K-PALS has shown to be inclusive in the general education classroom with substantial positive impact on the beginning reading skill. Pre-treatment and post-treatment measurements were administered in three broad categories of beginning reading skills:
1) phonemic awareness, 2) alphabetic principle, and 3) oral reading.

The participants of 89 kindergarten students with individualized education programs (IEP) were selected. Most of the students had speech or language disorders and the rest were identified with learning disabilities (LD), emotional and behavioral disorders (EBD), developmental cognitive delay (DCD), or attention deficit hyperactivity disorders (ADHD). The students were randomly assigned to three groups: 1) control (n = 21), 2) K-PALS Level 1 (teachers received 1-day workshop; n = 34), and 3) K-PALS Level 2 (teachers received workshop plus booster sessions; n = 34). The control group continued with their regular reading instruction in either whole class or small group format. Both K-PALS Level 1 and 2 groups received a 1-day workshop including the purpose and background of the strategy and detailed descriptions and demonstrations of the K-PALS activities. K-PALS Level 2 group attended additional three 1-hour-long booster sessions. The sessions focused on procedural questions, classroom management, student motivation, and discussion of support for students who struggle during K-PALS (Rafdal et al., 2011).

The researchers analyzed data to find results of the effectiveness of K-PALS in beginning reading outcomes for students with IEPs and the impact of the level of support given to the teachers who implement K-PALS measured by reading outcomes for students with IEP. The results indicated that students with disabilities in K-PALS groups reliably outperformed controls in areas of initial alphabetic principle and decoding skills such as Word Attack, Spelling, and Oral Reading. Additionally, there was no significant difference between K-PALS Level 1 and Level 2. Success factors of PALS mentioned in the study are high fidelity, level of teacher support, and increased student engagement (Rafdal et al., 2011).

Table 1

Summary of Chapter 2 Findings

Author(s)	Study Design	Participants	Procedure	Findings
Falk & Wehby (2001)	Quantitative	The participants were six kindergarten students placed in self-contained EBD classroom.	The pre-baseline phase consisted of teacher-led sound play activities. Then, baseline phase included teacher-directed decoding lessons. Finally, K-PALS intervention was conducted for 11 weeks with the entire class.	Analysis of data showed that the K-PALS program increased beginning reading skills of each of the participants.
Mathes & Babyak (2001)	Quantitative	The participants were 30 first-grade teachers assigned into three groups of ten. Also, 130 students were assigned into each of the group. The groups were First-Grade PALS, First-Grade PALS + ML, and contrast.	Pre- and post-test measured the participants' reading performance using WRMT-R. The model of curriculum-based measurement was used for progress monitoring. Skills such as oral reading fluency and phonological awareness were monitored.	Results indicate increase in reading performance of students who received First-Grade PALS treatment. Additionally, results suggest that mini-lessons were somewhat beneficial.
Fuchs, Fuchs, Thompson, Otaiba, Yen, Yang, Braun, & O'Connor (2001)	Quantitative	The participants were 33 teachers in either Title I or non-Title I schools. Also, 404 kindergarten students were selected including 25 students with IEP.	The teachers were randomly assigned into three groups: control, PA program, and PA program + PALS. The treatment was conducted for about 20 weeks. Pre- and post-test measures were RLN, RLS, Segmentation, Blending, subtests from WRMT-R, and WIAT.	Results indicated that the two treatment groups outperformed controls. PA program + PALS showed the highest achievement on reading and spelling tasks.

Table 1 (continued)

Author(s)	Study Design	Participants	Procedure	Findings
Fuchs, Fuchs, Thompson, Otaiba, Yen, Yang, Braun, & O'Connor (2002)	Quantitative	Nineteen kindergarten teachers were randomly assigned into three groups, PA + PALS, PA, and control groups, respectively. Twenty-five children with IEP were assigned into three groups.	Ten teachers in PA + PALS and PA groups conducted the treatments for approximately 20 weeks. Pre- and post-treatment data were collected in RLN, RLS, Segmentation, Word Attack, Word ID, Blending, and Spelling.	Results show that the students with disabilities in PA + PALS group performed superior to the other two groups. The contributing factors were implementation in an organized matter and increased student engagement through peer-mediation.
Fuchs, Fuchs, Mathes, & Martinez (2002)	Qualitative	The participants were 39 teachers having at least students with LD in each classroom. Each teacher identified four students with LD, of LA, AA, and HA.	The PALS group received distinct mix of reading activities, Partner Reading, Prediction Relay with Paragraph Shrinking, and Story Mapping. Whereas the contrast group continued with their typical instructional method during reading. HIFTO was used to measure the social status and attitudes of the participating students.	Results indicated that students with LD in PALS classes had higher social acceptance than those in the contrast classes. Furthermore, the students with LD in PALS classes received positive social preference rating equal to LA, AA, and HA students' ratings.

Table 1 (continued)

Author(s)	Study Design	Participants	Procedure	Findings
Mathes, Torgesesn, Clancy-Menchetti, Santi, Nicholas, Robinson, & Grek (2003)	Quantitative	The participants were 22 first-grade teachers and 89 students from diverse backgrounds.	Students through screening of their reading performance were assigned to three separate PALS, small group TDI, and control. All groups utilized parallel materials and parallel routines for 16 weeks. Pre- and posttest achievement was measured using WRMT-R, TOWRE, and CTOPP as well as CPM every other week.	Results suggested that both PALS and small group TDI enhanced reading performance of low achievers. PALS provided high academic engagement that linked to positive academic outcomes.
Sáenz, Fuchs, & Fuchs (2005)	Quantitative	The participants were 132 native Spanish-speaking students identified as ELL in grades 3 to 6. Twelve general education teachers in transitional bilingual education classrooms from one school district.	Participating teachers were randomly assigned to either PALS or the contrast. Pre- and post-test was conducted using The Comprehensive Reading Assessment Battery (CRAB). along with teacher and student questionnaires.	Growth of students in PALS condition surpassed the contrast group in reading comprehension regardless of student type. The result revealed key success factors as point award system and use of social skills in reading.
Calhoon, Al Otaiba, Cihak, King, & Avalos (2007)	Quantitative	The participants consisted 76 first-grade students in TWBI program.	The classrooms were randomly assigned to PALS and contrast condition. The treatment continued for 8 weeks with DIEBELS assessment as data collection.	Students in PALS condition demonstrated significant growth on phoneme segmentation fluency, nonsense word fluency, and oral reading fluency.

Table 1 (continued)

Author(s)	Study Design	Participants	Procedure	Findings
McMaster, Kung, Han, & Cao (2008)	Quantitative	A total of 60 kindergarten ELs participated in the study. An equal number of students were assigned to K-PALS ELs, Control ELs, and K-PALS non-ELs group.	Teachers implemented K-PALS four times per week for 18 weeks. Students' reading performance was measured by the Yopp-Singer test, RNL, RLS, WRMT-R, WIAT, and Flesch-Kincaid readability level.	Results indicated that K-PALS ELs performed higher than Control ELs on phonemic awareness and letter sound recognition.
Stein, Berends, Fuchs, McMaster, Sáenz, Fuchs, & Compton (2008)	Quantitative	The participants consisted of 279 teachers and 3,229 kindergarten students.	The study examined groups of four different levels of technical assistance in implementation of K-PALS. Data collection were based on RLS developed by Levy and Lysunchuk.	Analysis of data revealed that on-site technical assistance has significant effects on students' reading performance.
Rafdal, Mcmaster, Mcconnell, Fuchs, & Fuchs (2011)	Quantitative	The participants consisted of 89 kindergarten students assigned to controls, K-PALS Level 1, K-PALS Level 2.	K-PALS treatment was administered for four times per week for 18 weeks. Beginning reading skills were measured prior and past treatment.	Results did not show any statistically significant differences between the two levels of support; however, providing teachers with additional supportive sessions may have improved outcomes for some students with disabilities.

Chapter 3: Conclusions and Recommendations

The purpose of this literature review was to examine the success factors of peer-assisted learning strategies (PALS) to increase student reading performance, based on 11 studies. The focus of the review was in reading among different grade levels for effective inclusion of students with disability. Chapter 1 provided background information on the topic and Chapter 2 presented a review of the research literature. In Chapter 3, I discuss findings, recommendations, and implications from research findings.

Conclusions

I reviewed 11 studies with a date range from 2001 to 2011 that researched success factors in the implementation of PALS to support inclusion of students with disabilities in general education classrooms. Ten of the studies conducted quantitative research (Calhoon et al., 2007; Falk & Wehby, 2001; Fuchs et al., 2001a; Fuchs et al., 2002a; Mathes & Babyak, 2001; Mathes et al., 2003; McMaster et al., 2008; Rafdal et al., 2011; Sáenz et al., 2005; Stein et al., 2008). One of the studies conducted qualitative research (Fuchs et al., 2002b).

The review discussed many success factors of PALS leading to an acceleration in student reading skill: fidelity, explicit instruction, peer-mediated activity, increased student participation, level of teacher support, and contingency management.

Based on my analysis and review of the literature, I selected three crucial success factors of PALS: (a) fidelity of implementation, (b) peer-mediated activity with increased student participation, and (c) explicit instruction.

Fidelity of Implementation

Measurement of fidelity in evidence-based practice is an essential part of implementation. Having high fidelity shows that the implementation is preserving the components that made the original practice effective. It also directly impacts the success of desired outcomes in research. The desired outcome in the studies was an increase in student reading skills. In PALS, it is especially crucial to have high fidelity because the intervention requires both teacher and student to implement as trained. The findings support that high fidelity of implementation leads to increased student achievement compared to control groups. Ten of the studies explicitly measured and reported high fidelity scores and mentioned high fidelity as crucial factor in the review (Falk & Wehby, 2001; Fuchs et al., 2001a; Fuchs et al., 2002a; Fuchs et al., 2002b; Mathes & Babyak, 2001; Mathes et al., 2003; McMaster et al., 2008; Rafdal et al., 2011; Sáenz et al., 2005; Stein et al., 2008). Falk and Wehby (2001) reported that in two assessments, the teachers implemented with high fidelity. Fidelity of the decoding activities recorded to have increased from 89% to 100%. The "Guess My Word" sound play activity reported to have slightly decreased fidelity from 92% to 91%. Mathes and Babyak (2001) observed participants to check fidelity every 4-5 weeks for a total of three observations. Overall, teachers carried out PALS with 92.59% accuracy (*SD* = 4.82); students conducted Sounds and Words with an accuracy of 75.64% (*SD* = 14.55), and Story Sharing with 81.40% accuracy (*SD* = 12.09). Fuchs et al. (2001a) evaluated the participants' accuracy of implementation twice: Time 1 and Time 2. At Time 1, teachers scored 85% (*SD* = 5.80) and students recorded 87% (*SD* = 10.76) of average accuracy. At Time 2, teachers implemented with an average of 82% (*SD* = 11.84) and students with 77% (*SD* = 12.36). Fuchs et al. (2002a) conducted two observations on the accuracy of

teachers' implementation of PALS. The average accuracy at Time 1 was 81.50% (*SD* = 7.05); at Time 2, 72.25% (*SD* = 12.37). Fuchs et al. (2002b) collected fidelity on five elements. Average percentage of correctly implemented elements are Teacher Behavior 91.44% (*SD* = 7.45), Partner Reading 92.56% (*SD* = 4.59), Paragraph Shrinking 92.89% (*SD* = 7.16), Prediction Relay 91.83% (*SD* = 7.16), and Story Mapping 92.53% (*SD* = 3.74). Mathes et al. (2003) observed the participants three times every 4-5 weeks to ensure that the intervention was implemented as its originality. On average, teachers showed 89.22% accuracy (*SD* = 11.68). Students conducted Sounds and Words with 82.83% (*SD* = 9.13), and Story Sharing with 86.22% (*SD* = 9.13). Sáenz et al. (2005) evaluated a total of two fidelity checks on PALS activities and the participants' behaviors. The average accuracy for behaviors of teachers at Time 1 was 94% and at Time 2 was 93%. For student behaviors, the mean accuracy at Time 1 was 95% and at Time 2 was 93%. On PALS activities, overall, both teachers and students scored at least an average of 90% at both times. McMaster et al. (2008) emphasized that it is essential to implement PALS with fidelity. Teachers are provided with program manuals during PALS workshop training. The participating K-PALS group in the study showed the fidelity above 90% with an average of 95%. Stein et al. (2008) conducted two fidelity checks during the 20-week implementation. The checklist included participants' ability to follow the implementation procedures for the different activities. The mean fidelity of whole sample was 85.71% (*SD* = 11.54). Rafdal et al. (2011) administered two fidelity checks for two K-PALS groups, Level 1 and Level 2. Level 1 classes showed an average fidelity of 79.7%. Level 2 had a mean of 86.2% in the implementation of the intervention.

Sáenz et al. (2005) reported a fidelity score of over 90% for both teacher and student. They evaluated pre- to post-treatment improvement scores in PALS and contrast conditions.

Students with learning disabilities who received PALS treatment showed higher improvement score (M = 28.75) than those in contrast group (M = -4.54) in number of words read correctly. Fuchs et al. (2002a) reported the lowest fidelity score measured. Students with disabilities in PALS group received a higher growth score (M = 2.88) compared to control group in Word Attack. In conclusion, high fidelity score is associated with higher improvement score in students' reading skills. The fidelity scores in the review indicate accurate implementation of PALS and that effective components from the original practice have been maintained in each study. Employing the evidence-based practice with accuracy led to increase in student reading skills.

Table 2

Fidelity of Implementation

Study	Fidelity of Implementation
Falk & Wehby (2001)	Decoding activities: 89% (T1); 100% (T2) Sound Play activity: 92% (T1); 91% (T2)
Mathes & Babyak (2001)	Teachers: 92.59% (SD = 4.82) Students: Sounds and Words 75.64% (SD = 14.55) Story Sharing with 81.40% (SD = 12.09)
Fuchs et al. (2001a)	Teachers: 85% (SD = 5.80) (T1); 82% (SD = 11.84) (T2) Students: 87% (SD = 10.76) (T1); 77% (SD = 12.36) (T2)
Fuchs et al. (2002a)	81.50% (SD = 7.05) (T1) 72.25% (SD = 12.37) (T2)
Fuchs et al. (2002b)	Teacher Behavior: 91.44% (SD = 7.45) Partner Reading: 92.56% (SD = 4.59) Paragraph Shrinking: 92.89% (SD = 7.16) Prediction Relay: 91.83% (SD = 7.16) Story Mapping: 92.53% (SD = 3.74)

Table 2 (continued)

Study	Fidelity of Implementation
Mathes et al. (2003)	Teachers: 89.22% (*SD* = 11.68) Students: Sounds and Words: 82.83% (*SD* = 9.13); Story Sharing: 86.22% (*SD* = 9.13)
Sáenz et al. (2005)	Teachers: 94% (T1); 93% (T2) Student: 95% (T1); 93% (T2)
McMaster et al. (2008)	95%
Stein et al. (2008)	85.71% (*SD* = 11.54)
Rafdal et al. (2011)	K-PALS Level 1: 79.7% K-PALS Level 2: 86.2%

Peer-Mediated Activity with Increase in Student Participation

Students were in charge of activities in PALS treatment groups in the review. Students in PALS groups were assigned in pairs based on ability grouping in the manual. Nine studies explicitly mentioned peer-mediated activity and an increase in student participation as a success factor for PALS (Calhoon et al., 2007; Fuchs et al., 2001a; Fuchs et al., 2002a; Fuchs et al., 2002b; Mathes & Babyak, 2001; Mathes et al., 2003; McMaster et al., 2008; Rafdal et al., 2011; Sáenz et al., 2005). Mathes & Babyak (2001) noted the most positive effect of PALS on increased student participation. The program provided students with dramatically greater opportunity to actively engage in reading. The study also mentioned that PALS efficiently and effectively used given instructional time to boost academic achievement. In fluency measure, low-achieving students in the PALS treatment group reported higher change in score ($M = 5.44$, $SD = 4.06$) than those in the contrast group ($M = 1.83$, $SD = 3.14$). Fuchs et al. (2001a) claimed that peer mediation was the critical factor in promoting academic growth in students. Students in the treatment group were largely responsible for the implementation of PALS, which resulted in

reciprocal interaction between partners. This provided frequent and repeated opportunity to respond and to practice skills. It led to increased academic engagement time of the students. Moreover, the process also allowed immediate corrective feedback to students. The authors suggest that PALS activities relate to zone of proximal development (Vygotsky, 1978) of the lower achieving students. In other words, peer mediation allows assistance from the more skilled learner to the less skilled learner by promoting student participation. In phonological awareness measure, students in PALS group higher growth score from pre-treatment (M = 3.95, SD = 3.79) to post treatment (M = 17.93, SD = 5.12) than those in control group from pre-treatment score (M = 3.02, SD = 2.03) to post-treatment score (M = 10.18, SD = 6.71). Fuchs et al. (2002a) showed that carefully designed student-led activities in PALS contributed to strong growth in reading skills. Especially, students with disabilities displayed an increase in performance in an inclusion setting. In phonemic awareness measure, students in the PALS group reported higher growth score (M = 14.87, SD = 8.10) than those in the contrast group (M = 0.67, SD = 0.82). Fuchs et al. (2002b) pointed out peer interaction and engagement as success factors. In the study, students with disabilities were more socially accepted by their peers in general education settings. Students with disabilities in the PALS group received a higher social preference score (M = 26.09, SD = 25.65) than those in the control group (M = -5.69, SD = 23.47). Mathes et al. (2003) stated that designed lessons in PALS encouraged student participation. The opportunity promoted low-performing students to learn and apply basic reading skills. Students were also provided routines that are engaging and motivating, which resulted in higher participation. In fluency measures, students in the PALS treatment group reported a higher change score

(*M* = 10.94, *SD* = 5.70) than those in the contrast group (*M* = 7.61, *SD* = 6.45). Sáenz et al. (2005) found peer mediation to be effective for ELLs to grow in the areas of expressive and receptive language and comprehension skills. PALS provided frequent opportunities to practice discourse in English for ELLs by working in pairs. In the fluency measure, students in the PALS treatment showed a higher improvement score (*M* = 13.43, *SD* = 17.97) than those in the contrast group (*M* = 8.44, *SD* = 24.28). Calhoon et al. (2007) viewed that PALS allowed students to more actively engage in their own learning. Acceleration in reading was possible due to the participants' high level of engagement in applying reading skills in peer mediation. The program also provided repeated opportunities to promote fluency. In oral reading fluency measure, students, regardless of their English proficiency, displayed a higher improvement score (*M* = 12.02, *SD* = 10.26) than those in the contrast group (*M* = 6.81, *SD* = 10.11). McMaster et al. (2008) emphasized that students in the PALS group were allowed frequent opportunity to respond. This encouraged more participation of the students in the lesson compared to the control group. In fluency measure, students in K-PALS reported a higher posttest score (*M* = 10.80, *SD* = 11.72) than those in the control group (*M* = 9.55, *SD* = 11.34). Rafdal et al. (2011) indicated that students in the PALS group demonstrated increased participation in the lesson. In terms of fluency, students in the control classroom scored lower (*M* = 8.69, *SD* = 7.33) than students in the K-PALS classroom (*M* = 12.46, *SD* = 14.59). This can be attributed to allowing students with disabilities to more actively interact academically with peers in the general education classroom. The students could repeatedly practice foundational reading skills to contribute to enhancing their reading performance.

In conclusion, peer-mediated activity with an increase in student participation resulted in providing the learners with repetition, modeling, and practice. The PALS treatment group provided relatively frequent and repeated opportunities to practice and apply basic reading skills. Furthermore, this strengthened student reading skills and has positively influenced student performance and increased student achievement.

Explicit Instruction

As stated above, it was concluded that PALS was implemented with fidelity, which can be interpreted as easy to implement. The review indicates that precise instruction and structure contributes to the feasibility of implementation. Explicit instruction in PALS includes precisely stated practice time, scripted prompts, tasks, and activities in the manual. The manual is accessible to teachers in the training and throughout the implementation. Seven of the studies in the review listed explicit instruction in PALS as a success factor in PALS (Calhoon et al., 2007; Falk & Wehby, 2001; Fuchs et al., 2001a; Mathes & Babyak, 2001; Mathes et al., 2003; McMaster et al., 2008; Stein et al., 2008). Falk et al. (2001) revealed that activities with more explicit instruction and practice time during peer tutoring sessions were linked to higher scores. One distinctive characteristic of PALS is that teachers monitor activities led by students. The study showed that in student-centered activities, explicit instruction and structure leads to higher performance in students. In phonological measures, students displayed an overall increase with an average of 11.2 in the total number of correct responses from pre-test to post-test probes. Mathes & Babyak (2001) mentioned the Sounds and Words component of 1st grade PALS represented explicit instruction of the alphabetic principal. The contrast group received little

explicit instruction. In fluency measure, low-achieving students in the PALS treatment group reported a higher change in score (*M* = 5.44, *SD* = 4.06) than those in the contrast group (*M* = 1.83, *SD* = 3.14). The team believed that systematic instruction contributed to higher student achievement in reading. Fuchs et al. (2001a) pointed out that teachers in PALS provided regular and systematic instruction on beginning decoding skills. Instructions and tasks were explicitly stated for both teachers and students in PALS. Especially for students, an organizational strategy for delivering decoding instruction and facilitating practice were provided in the implementation. In phonological awareness measure, students in the PALS group had a higher growth score from pre-treatment (*M* = 3.95, *SD* = 3.79) to post-treatment (*M* = 17.93, *SD* = 5.12) than those in the control group from pre-treatment score (*M* = 3.02, *SD* = 2.03) to post-treatment score (*M* = 10.18, *SD* = 6.71). Mathes et al. (2003) attributed the positive effect of PALS to carefully designed lessons, routine, structure, and materials. The lessons were designed with consideration in students' performance. It also provided routines and structures in the provided materials. These factors allowed explicit instruction in the implementation of PALS. In fluency measure, students in the PALS treatment group reported a higher change score (*M* = 10.94, *SD* = 5.70) than those in the contrast group (*M* = 7.61, *SD* = 6.45). Calhoon et al. (2007) noted that PALS provided explicit code-focused instruction. In addition, the program included structured academic discourse with routines for students to follow. In oral reading fluency measure, students, regardless of their English proficiency, displayed a higher improvement score (*M* = 12.02, *SD* = 10.26) than those in the contrast group (*M* = 6.81, *SD* = 10.11). McMaster et al. (2008) indicated that explicit instruction in PALS supported the growth

in student achievement. Mostly in the areas such as vocabulary and oral language, fluency shows strong growth for ELLs. In fluency measure, students in K-PALS reported higher post-test scores (M = 10.80, SD = 11.72) than those in the control group (M = 9.55, SD = 11.34). Stein et al. (2008) concluded that the characteristic of PALS being highly structured contributed to the gain in student reading. Additionally, PALS provides specific plans for teachers with accessible manuals and materials for routine. Comparison of post-test scores show that students in the PALS group reported a higher score (M = 41.70, SD = 17.80) than those in the control group (M = 32.90, SD = 17.00).

In conclusion, PALS consisted of carefully designed lessons, routines, and materials. In the treatment group students were assigned to clear roles and scripted prompts in employing PALS. Whereas in the control group, student roles and routines were relatively inconsistent and unexpected. The consistency and structure in the PALS treatment group lesson resulted in significant student growth in reading.

Other Factors

As stated above, fidelity of implementation, peer-mediated activity with increased student participation and explicit instruction were the most frequently cited success factors in PALS. There are additional factors that contribute to the success of PALS. Contingency management, either individualized or embedded in the program, was viewed as another success factor in three studies (Falk & Wehby, 2001; Fuchs et al., 2002b; Sáenz et al., 2005). Falk and Wehby (2001) studied students with EBD and noted that there was an increase in one student's performance with behavioral contingency in act. The teacher established an individualized behavioral contract with the student to promote more appropriate behaviors during the PALS session. To decrease

the student's noncompliant and off-task behaviors that interfered with his participation, the behavioral contract ensured a tangible reinforcer to the student as a reward. As a result, there was a notable increase in his test scores. Fuchs et al. (2002b) highlighted the motivational system embedded in the intervention. Assigned pairs in PALS were again divided into two teams. Students earned points for their team by completing reading activities correctly and by demonstrating appropriate behavior. The system combined competition between teams and cooperation in the pairs' and their team's shared effort. The result indicated that the system contributed as a success factor in PALS. Sáenz et al. (2005) also indicated that contingency management embedded in the intervention supported success in PALS treatment condition. Students in pairs were assigned in two teams using the same method to assign pairs. In the teams, the students had an opportunity to earn points by demonstrating appropriate behavior. The desired behaviors were directly associated with each PALS activity. This motivated the students to cooperate and collaborate with each other to earn points. On the other hand, the contrast group did not include a specific behavioral contingency system during instruction. In conclusion, contingency management in PALS activity motivated student engagement and on-task behavior which resulted in positive influence on student performance.

Two studies concluded the level of teacher support as another success factor (Rafdal et al., 2008; Stein et al., 2008). Stein et al. (2008) noted that the level of teacher support for K-PALS is crucial for early reading achievement gains. As the increase in support level from workshop to booster sessions, students' performance also dramatically increased; however, results showed that the highest level of teacher support in the helper condition did not outperform those in the lower condition, booster sessions. This may be due to lack of highly

trained professional assistance as helpers. The graduate assistants as assistants may have failed to provide consistent and technical support, which led to a different result than previously hypothesized. Rafdal et al. (2008) compared two different levels of teacher support. Level 1 had minimal contact with the researchers only focusing on procedural support. Whereas, Level 2 received more booster sessions on classroom management, student motivation, and discussion of students having difficulties during PALS. There were no statistically significant differences between the two levels in student performance, which may need additional research; however, Level 2 teachers displayed higher fidelity in implementation. Moreover, the analysis of data showed that more students responded to K-PALS in Level 2 than Level 1. In conclusion, as the level of teacher support increases, student achievement somewhat increases accordingly. There were not enough highly trained professionals as on-site technical assistance in the studies, which may have intervened with the desired outcome.

Table 3

Success Factors of Peer Assisted Learning Strategies (PALS)

Study	Success Factors in Implementing PALS
Falk & Wehby (2001)	● Fidelity ● Contingency management ● Explicit instruction
Mathes & Babyak (2001)	● Fidelity ● Student participation ● Explicit instruction
Fuchs et al. (2001a)	● Fidelity ● Explicit instruction ● Student participation ● Peer-mediated activity

Table 3 (continued)

Study	Success Factors in Implementing PALS
Fuchs et al. (2002a)	● Fidelity ● Student participation
Fuchs et al. (2002b)	● Fidelity ● Student participation ● Peer-mediated activity ● Contingency management
Mathes et al. (2003)	● Fidelity ● Explicit instruction ● Peer-mediated activity ● Student participation
Sáenz et al. (2005)	● Fidelity ● Contingency management ● Student participation ● Level of teacher support
Calhoon et al. (2007)	● Student participation ● Explicit instruction
McMaster et al. (2008)	● Fidelity ● Explicit instruction ● Student participation
Stein et al. (2008)	● Fidelity ● Explicit instruction ● Level of teacher support
Rafdal et al. (2011)	● Fidelity ● Level of teacher support ● Student participation

Recommendations for Future Research

The review provided a positive correlation between PALS and improvement in student reading performance; however, the studies also presented several limitations in the research that might have affected achieving desired outcomes.

First, the samples of the studies lacked diversity. The majority of those representing students in special education were students with learning disabilities. More data on different

types of disability categories is needed to examine the effectiveness of PALS. Additionally, PALS activities involve verbal and speech abilities of students. It is plausible that deficits in either receptive or expressive language abilities somewhat influenced student achievement. Due to the characteristic of the program, further research on ability of students impacted by speech deficit is needed. As for ELs, first language of the students in the research was homogenous. The samples lacked heterogeneous language pairs in terms of students' first language. Therefore, future research should include a more diverse student population with different types of disabilities and first language of students.

Secondly, the studies were conducted at most 20 weeks to measure the effect of PALS in student reading skills. Furthermore, the majority of the PALS treatment was implemented three times a week. Future research with longer duration of PALS treatment is needed to determine long-term influence. Additionally, an increase in instructional time from three times a week to over might show a different result.

Third, the studies did not present enough positive correlation between the increase in foundational reading skills and further reading achievement. Extended research can examine the relationship between the positive effect of PALS and the increased performance on standardized word-reading measures, oral reading fluency compared to toward national norms.

Finally, the majority of research focused on the academic influence of PALS. The review evidently shows that PALS promotes academic success in reading; however, the intervention is based on peer social interaction. Further research on sociometric data to examine its influence on peer relationships would be beneficial. Additionally, in order to determine the social impact of PALS, more qualitative research is in need.

Implications for Current Practice

PALS emerged to meet the need in employing evidence-based practice to provide the least restrictive environment to students with disabilities. Later, the sample of the research expanded to students of different linguistic backgrounds to further investigate its effectiveness. The need to incorporate best practices in general education settings increased significantly, along with the establishment of NCLB. As a result, teachers began to bring in research-based practices to their classrooms. Among numerous options, PALS was selected to be beneficial and effective for a number of reasons. To begin with, it is a supplementary reading program and can be incorporated to an already existing curriculum. It strengthens instruction in general education classrooms to be more interactive and cooperative. PALS provides carefully planned manuals when assigning students in pairs. In many general education settings, teachers need to take into account different levels of student performance. Instructions are to embrace a wide range of higher and lower achieving students. PALS resolves the demand in facilitating cooperation in students with balance. Student-centered instruction naturally provides lessons to become more engaging and motivating to students. Moreover, the program includes structure and routine for both teachers and students to easy follow. Students are given explicit directions to implement activities with reciprocal interaction. Within the intervention, differentiation is also possible to meet the unique needs of students. For instance, integrating behavior management or individualized scaffolding.

In order to successfully implement evidence-based practices to ensure positive outcomes, high fidelity is required. PALS was considered easy to implement by the participants which enabled them to yield high fidelity. The feasibility can be increased with appropriate professional

development and training provided to teachers. Additionally, on-site technical assistance by highly trained professionals during implementation can positively affect the desired outcome. Consequently, with high fidelity and its supporting factors, mainstream classrooms can indeed become more inclusive to a greater range of students.

Summary

Numerous factors contributed to successful reading performances after implementing PALS in general education classrooms based on research I have reviewed. The findings of the studies reveal that employing PALS resulted in strong growth in students' reading performance due to the high fidelity of implementation, peer-mediated activity with increased student participation, explicit instruction, contingency management, and level of teacher support. Barriers must be addressed throughout the implementation of PALS to promote desired outcomes. In conclusion, PALS makes it possible for educators to make mainstream instruction sufficiently clear, compelling, differentiated, interactive, data-driven, and supportive to be inclusive and responsive to all students, regardless of their disability or diverse needs.

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